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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/635,484

08/07/2003

Humbs Werner

6160067AA

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03/14/2005

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EXAMINER

DOLAN, JENNIFER M

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/635,484

Applicant(s)

WERNER ET AL.

Examiner

Jennifer M. Dolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/7/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification (page 2, line 20; page 3, line 9; page 4, lines 1-3) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 9-15, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication 08-222371 to Shimo et al.

Regarding claims 1, 9-12, and 20 Shimo discloses a method and apparatus for structuring a homogeneous electrode for an organic light emitting display (paragraph 0001), the method and apparatus comprising: a laser light source (paragraphs 0016-0019; figures 3a-3c) and an optical

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unit (paragraph 0019; beam homogenizer and widener; also see figure 3b) such that the laser beam is expanded and widened to cover each target portion of each electrode to be ablated to form periodic structures (figure 3b); and a step of ablating the target portions of the electrode using the expanded beam (paragraph 0023-0025).

Regarding claim 2, Shimo discloses that the periodic structures are linear structures (figure 3b).

Regarding claims 3 and 19, Shimo discloses that the electrode is a cathode (paragraph 0018).

Regarding claims 13 and 14, Shimo discloses using an optical unit having a mask (paragraph 0020), which inherently has a plurality of gaps.

Regarding claim 15, Shimo discloses that the optical unit has a beam homogenizer, a gap, and at least one cylindrical lens (paragraphs 0023; 0020).

4. Claims 1-3, 7, 9-15, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,719,916 to Dubowski et al.

Regarding claims 1, 9-12 and 20, Dubowski discloses a method and apparatus for structuring a homogeneous electrode for an organic light emitting display (see figures 3 and 4), the method and apparatus comprising: a laser light source (10) for emitting the beam (12); an optical unit (14) such that the laser beam is expanded and widened to cover each target portion of each electrode to be ablated to form periodic structures (entire mask is exposed and patterned – hence, each target portion of each electrode is covered by the beam; see figure 3; column 5, lines

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15-35); and ablating respective target portions of the electrode using the expanded beam (column 5, lines 1-67).

Regarding claim 2, Dubowski discloses that the periodic structures are linear structures (figures 3 and 4).

Regarding claims 3 and 19, Dubowski discloses that the electrode is a cathode (column 5, line 50 – column 6, line 20).

Regarding claim 7, Dubowski discloses that the electrode is coated with a material for facilitating absorption of the laser beam prior to the ablation (column 4, line 60 – column 5, line 13; column 5, lines 50-67).

Regarding claims 13-15, Dubowski discloses that the optical unit comprises a beam homogenizer (22), a plurality of gaps (in mask, 16, 17), and at least one cylindrical lens (26).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimo et al.

Shimo discloses that the laser beam is a pulsed KrF excimer laser (paragraph 0023). A KrF laser will inherently emit at 248 nm. Shimo further teaches that the pulse duration is desirably as small as possible, and preferably less than 100 ns.

Shimo fails to indicate a pulse width of 20 ns or less.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the pulse width of the pulsed laser in Shimo is 20 ns or less. The rationale is as follows: A person having ordinary skill in the art would have been motivated to provide a very narrow pulse width, because Shimo shows that pulse width should be shortened to minimize thermal breakage of the anode and organic layers, yet must be sufficient to ablate the cathode layer (see paragraph 0018). Although Shimo fails to specifically disclose a pulse width of 20 ns or less, it has been held that “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

7. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimo et al. in view of U.S. Patent No. 6,576,867 to Lu et al.

Shimo discloses that the laser ablation of the metal and organic layers generates debris. Shimo further teaches that the debris is removed from the system by blowing an inert gas stream into the processing region, such that the debris is prevented from redepositing on the device (paragraphs 0021-0022).

Shimo fails to disclose the specific structure by which the debris is removed from the system.

Lu discloses a laser ablation system wherein debris is removed by a system substantially similar to that of Shimo, including an exhaust unit having an outlet vent (column 4, lines 42-48; ‘exhaust inlet’ 52 acts as an outlet vent, since it extracts fumes and debris generated by the ablation from the device region).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the apparatus of Shimo includes the exhaust unit and outlet taught by Lu. The rationale is as follows: A person having ordinary skill in the art would have been motivated to provide an exhaust unit with an outlet vent in the apparatus of Shimo, because Shimo teaches that the debris and residues generated by ablation must be removed from the device area by use of an air blower, but does not provide a complete structure whereby this is accomplished. Since Lu teaches an ablation apparatus including an air blower to remove debris and fumes from the device area, and since Lu further provides an apparatus structure including an exhaust unit and outlet by which the debris extraction is possible (Lu, column 4, lines 42-48), it is well within the purview of a person skilled in the art to combine the apparatus of Shimo with any ablation apparatus teaching the specifics of debris removal, such as that taught by Lu, in order to accomplish the debris-removal in Shimo (also see Shimo, paragraphs 0021-0022).

Allowable Subject Matter

8. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The primary reason for allowability is that the prior art fails to suggest coating an electrode with graphite for facilitating absorption of the laser beam prior to ablation. The prior art either

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suggests a direct ablation of the metal electrode layer (see Shimo et al, for example), or use of alternate materials, such as silver (see Dubowski et al.) for promoting antireflection or absorption of the laser beam. Although it is further known in the art that graphite is absorptive of ultraviolet light, there is no suggestion in the prior art that such a layer is usable for coating a metal electrode layer to promote ablation, nor is there any suggestion that graphite would be a compatible or viable material with an OLED structure, OLED manufacturing processes, or laser ablation of metal electrodes in general. Hence, it is the examiner's opinion that a person having ordinary skill in the art would have found no motivation to use graphite as a metal electrode coating layer in an OLED fabrication process.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,376,799 to Amako et al., U.S. Patent No. 6,146,715 to Kim et al., and U.S. Patent No. 5,514,618 to Hunter, Jr. et al. disclose various methods of laser ablation of electrodes in OLED devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


ERIK KIELIN
PRIMARY EXAMINER